Sustainability Protocol

Environmental criteria for AMB and IMPSOL projects and works

Public Space Services Directorate

AMB

AMB

Energy and emissions

38%

Water

-12%

Biodiversity

Habitats loss

Health

-157.000

How do we contribute to a sustainable development of public space?

AMB

Energy and emissions

38%

Water

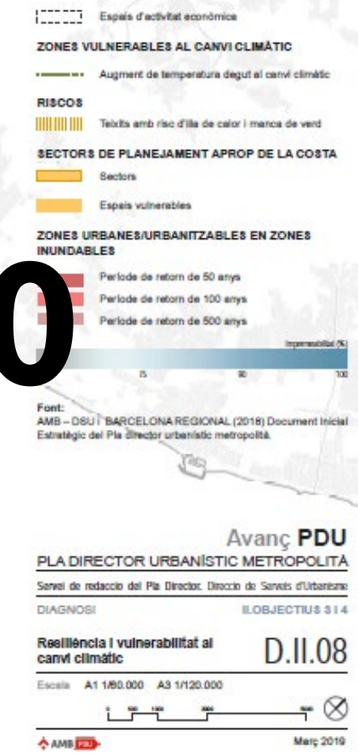
-12%

Biodiversity

Habitats loss

Health

-157.000



AMB

Barcelona metropolitan area

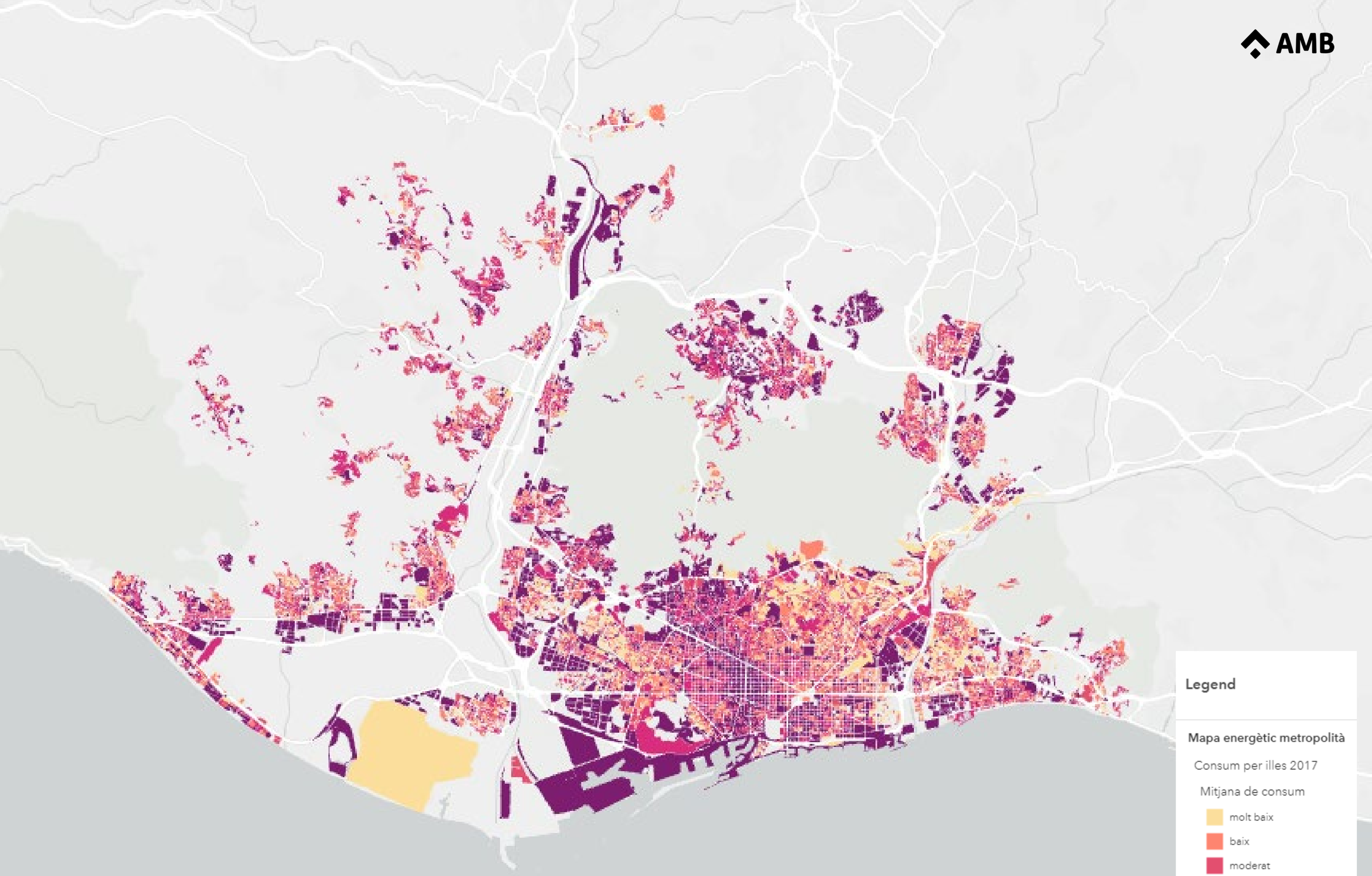
52%
of open spaces

900 km
contact between urban and open spaces

Climate change mitigation

Energy and emissions

38 %



Energetic metropolitan map. Average consumption per blocks, 2017

Embodied emissions

Embodied emissions

— Reduce the amount of material

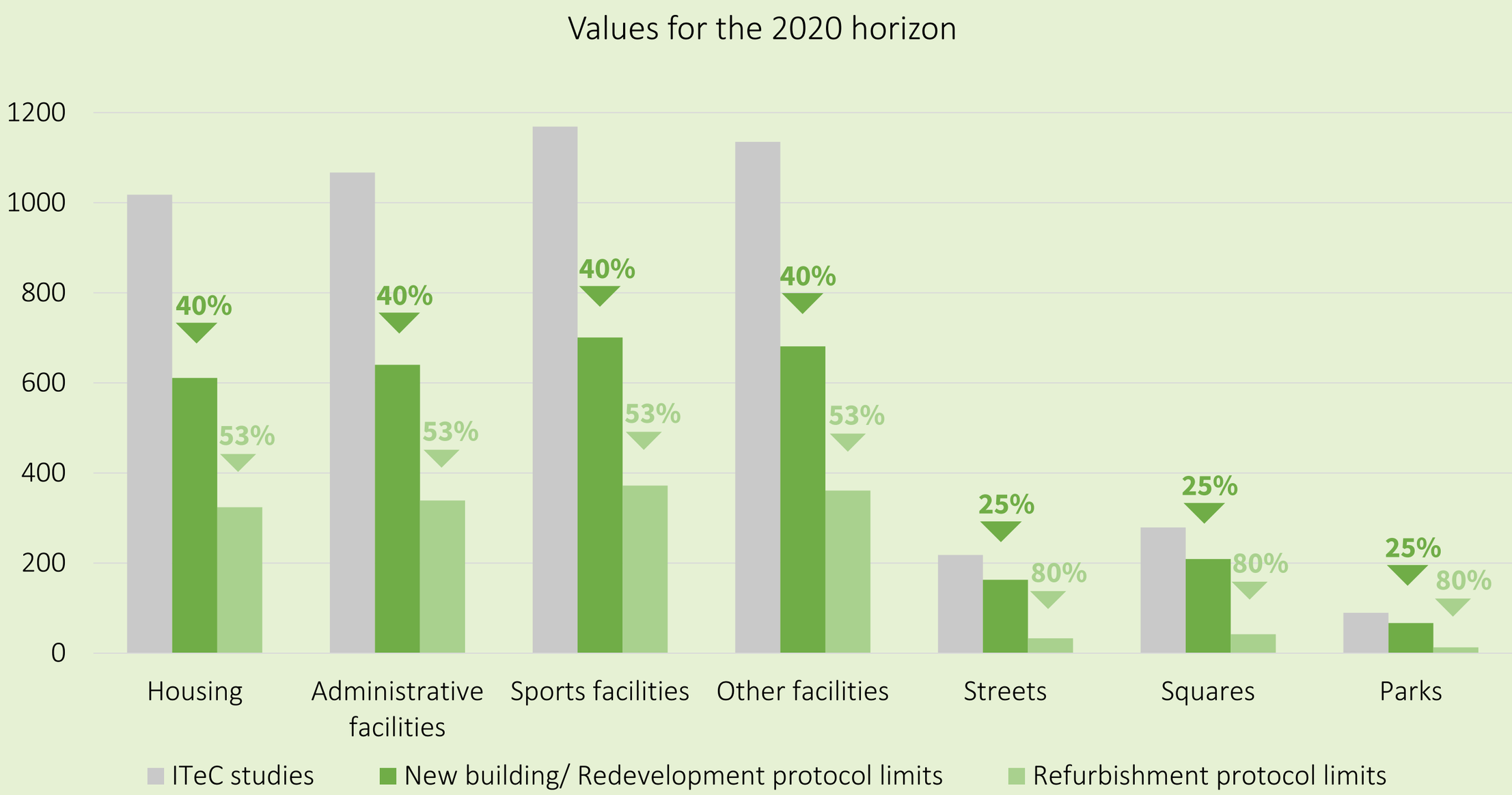
Embodied emissions

— Reduce the amount of material

— Limit embodied CO_2

$kgCO_2/m^2$

Maximum embodied CO_2 footprint



Source: AMB, ITeC and ERF

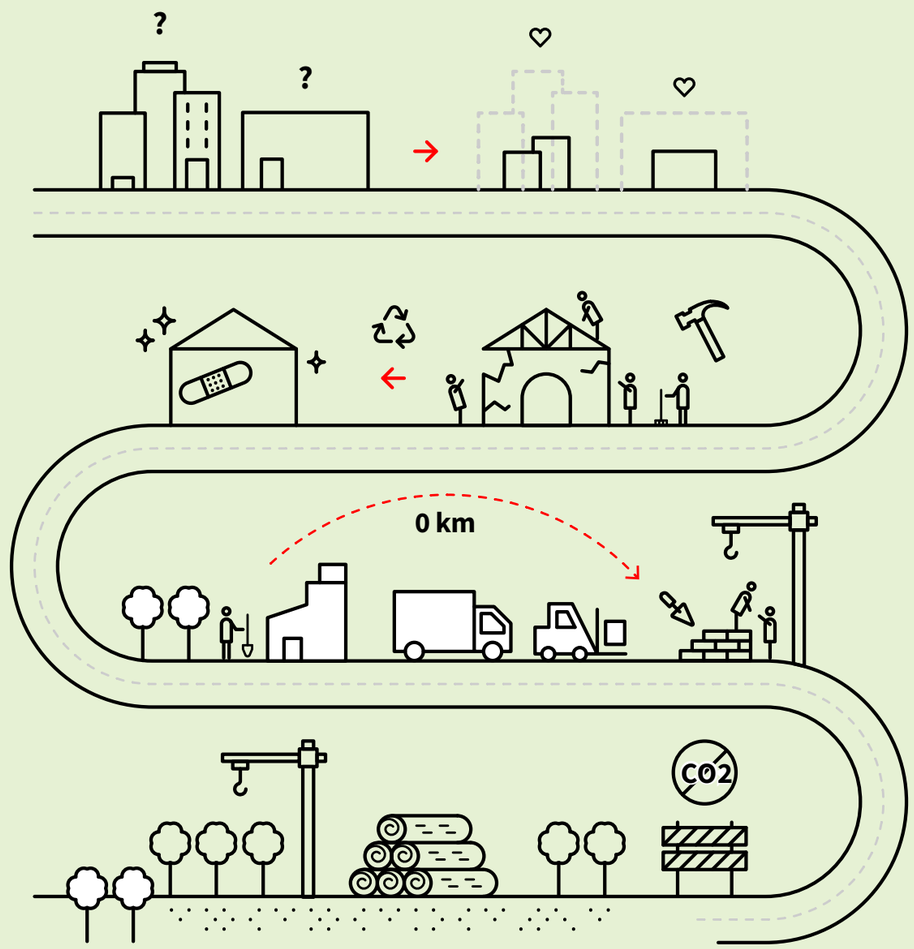
Maximum embodied CO_2 footprint

Reference data

7.1 Table of values for the 2020 horizon.

Project type	Maximum carbon footprint ($kgCO_2/m^2$) depending on type of intervention	
	New building/ Redevelopment*	Renovation*
Housing units*	611	324
Administrative facilities	640	339
Sports facilities	701	372
Other facilities*	681	361
Streets**	163	33
Squares**	209	42
Parks**	67	13

(*)(**) See conditions in the Sustainability Protocol.



Source: AMB sustainability protocol

Operational energy

— Limit energy demand and total primary energy consumption

kWh/m²·year

Maximum demand and primary total energy consumption

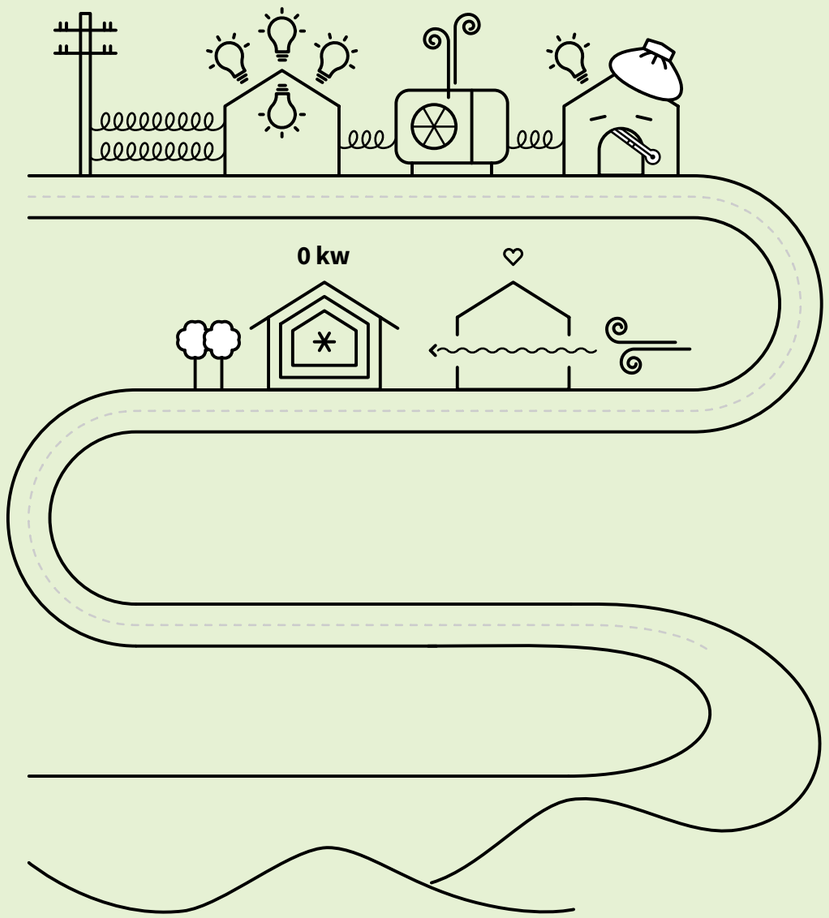
Reference data

4.2 Table of values for the 2020 horizon.

Building's consumption according to its main use	Global demand (kWh/m^2year)	Zone C2	Zone D2
		Total PEC (kWh/m^2year)	Total PEC (kWh/m^2year)
High/ very high*	20	110	90
Average*		95	85
Low*	15	35	40

***High/ very high:** civic center, library, museum, sports facilities, schools, sanitary center, nursing home and other similar uses.
***Average:** administrative, police station, fire station, market and other similar uses.
***Low:** housing units.

Source: AMB sustainability protocol



Operational energy

—Limitar la demanda i consum energètics

— Produce renewable energy

kWp

Renewable energy production

Reference data

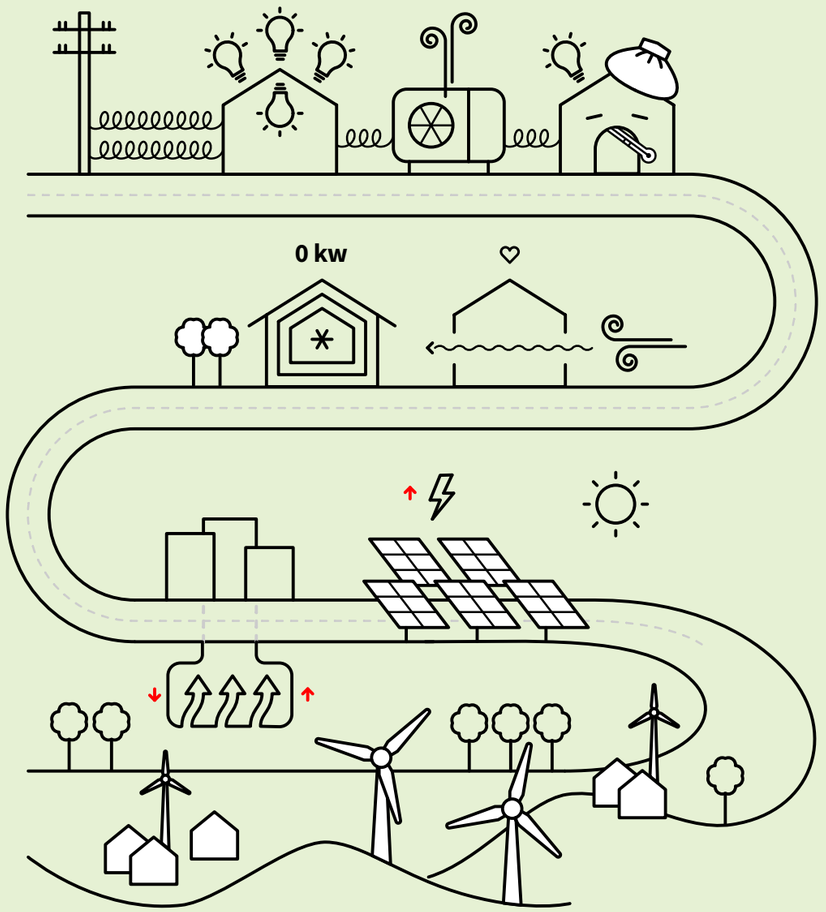
5.1 Table of values for the 2020 horizon.

Project type	Minimum generation	Additional percentage required by the CTE
Streets [1]	15 kWp | 2 kWp	
Parks and squares [1]	15 kWp | 2 kWp	
Facilities buildings [2]		5% - 20%
Housing units [2]		5% - 20%

([1]) ([2]) See conditions in the Sustainability Protocol.

Facilities buildings		Housing units	
Global demand (kWh/m²·any)	**Renewable installation***	**Global demand (kWh/m²·any)**	**Renewable installation***
≤ 15	5 %	≤ 10	5 %
16	8 %	11	8 %
17	11 %	12	11 %
18	14 %	13	14 %
19	17 %	14	17 %
20	20 %	15	20 %

Source: AMB sustainability protocol



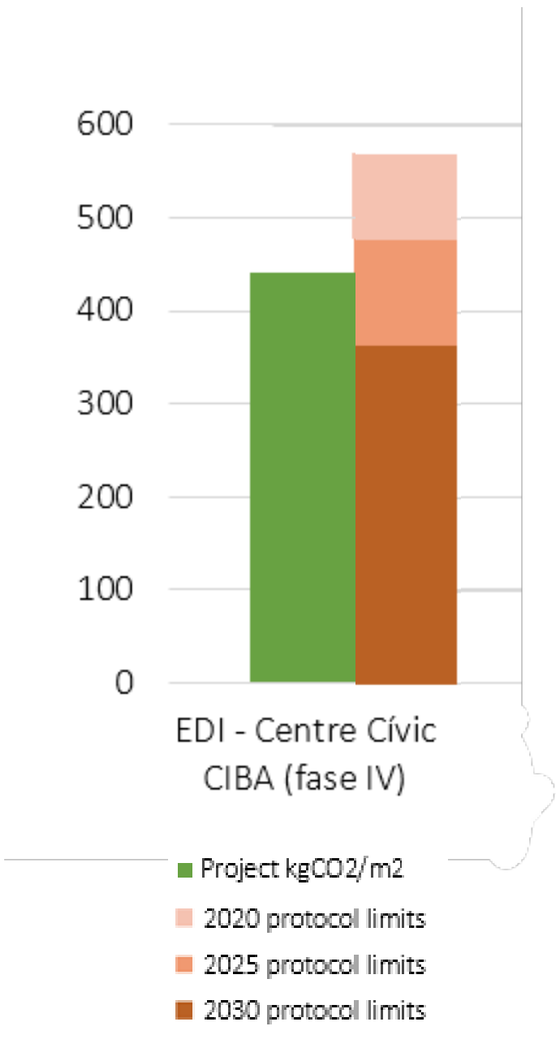
La CIBA

Source: AMB

Case study

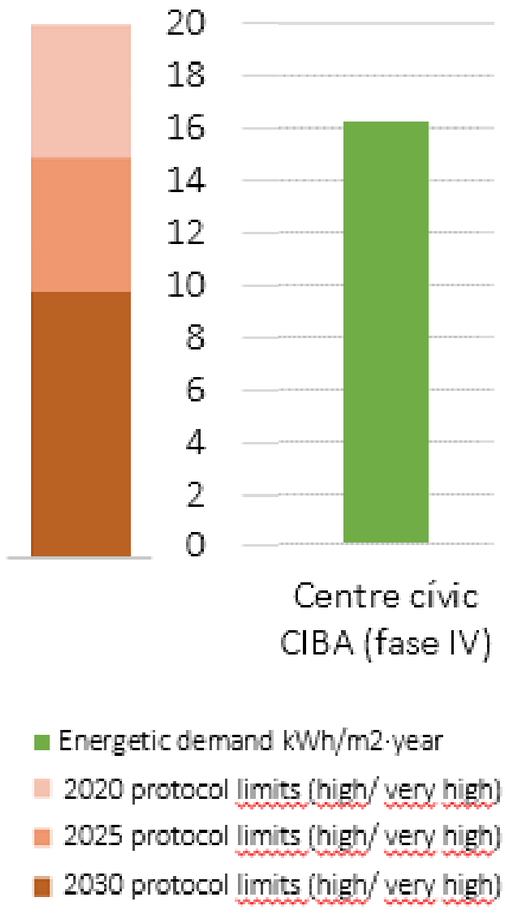
La CIBA project in Santa Coloma de Gramenet (2021)

Embodied emissions

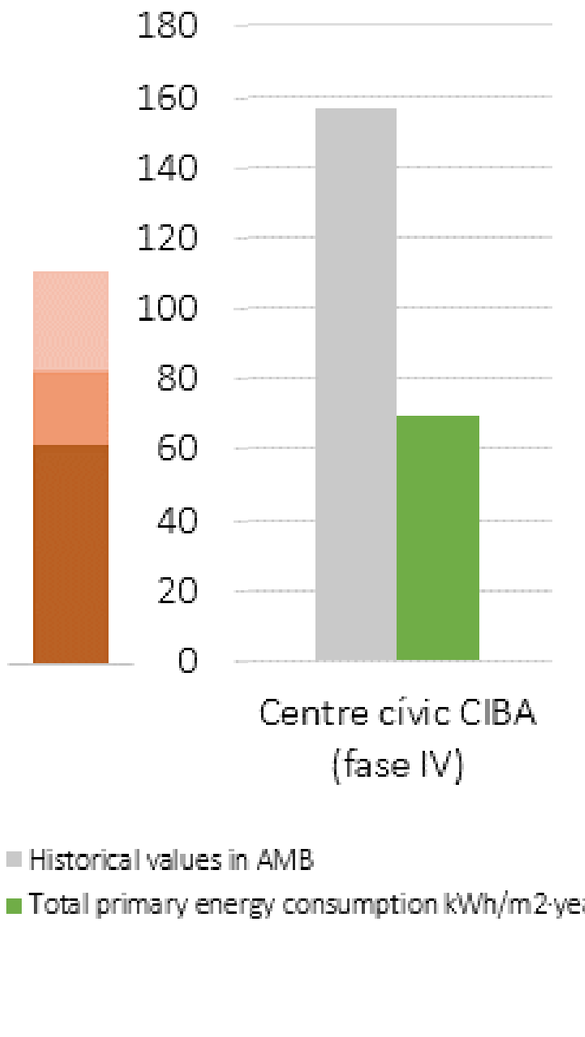


Operational energy

Demand



Total primary energy consumption



Source: AMB

Climate change adaptation

AMB

Water

Biodiversity

Health

Water

-12 %

Close the water cycle

AMB

AQÜÍFERS ESTRATÈGICS DE L'AMB

Zona de recàrrega

Baix Besòs i Pla de Barcelona

Cubeta de Sant Andreu i Vall Baixa del Llobregat

Delta del Llobregat

Font:
AMB – DSU i BARCELONA REGIONAL (2018) Document Inicial Estratègic del Pla director urbanístic metropolità.

Avanç **PDU**

PLA DIRECTOR URBANÍSTIC METROPOLITÀ

Servei de redacció del Pla Director. Direcció de Serveis d'Urbanisme

DIAGNOSI II.OBJECTIUS 3 I 4

Aqüífers protegits i espais de recàrrega D.II.02

Escala A1 1/60.000 A3 1/120.000

Març 2019

Protected aquifers and recharge zones

Water

— Water recover and reuse

Water

— Water recover and reuse

— Manage surface runoff (Sustainable Urban Drainage Systems)

l/m²·any

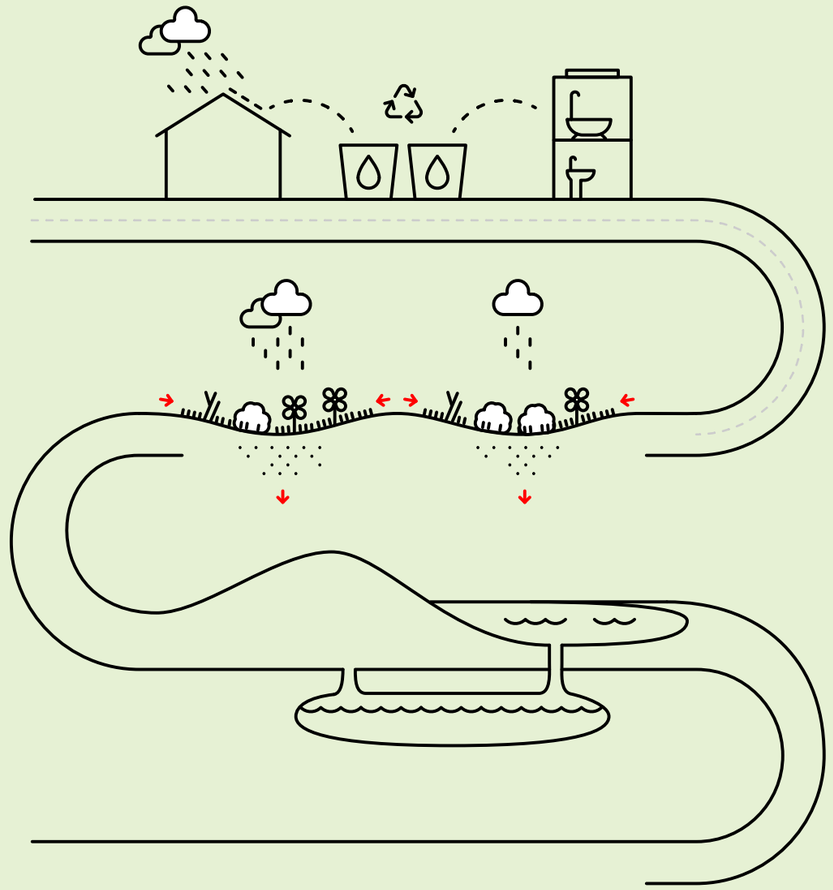
Minimum rainfall to manage

Reference data

15.1 Table of values for the 2020 horizon.

Minimum rainfall to manage (mm)	
Streets, squares, parks	**Outdoor space over 200 m^2 in building projects**
15*	10*

(*) See conditions in the Sustainability Protocol.



Source: AMB sustainability protocol

Water

— Water recover and reuse

— Manage surface runoff (SUDS)

— Use of alternative water resources

Water

— Water recover and reuse

— Manage surface runoff (SUDS)

— Use of alternative water resources

— Limit water consumption of the irrigated area

l/m²·any

Maximum water consumption for irrigation

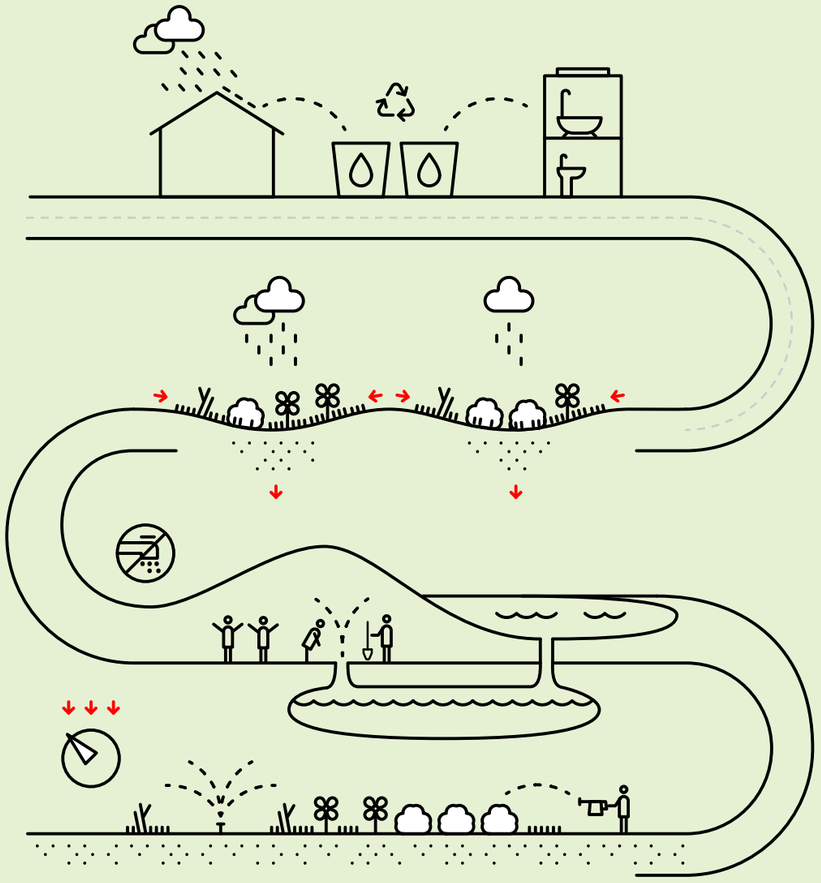
Reference data

6.4 Table of values for the 2020 horizon.

Drinking water consumption (l/m^{2}year)	Total consumption (l/m^{2}year)
450	700

*Total consumption: sum of regenerated, phreatic and drinking water consumption

— Rain water: priority use and unlimited



Source: AMB sustainability protocol

Biodiversity habitats loss

Promote and preserve biodiversity

AMB

CATEGORIES

Arees nuclis

Punts crítics ecològics

Dinamització agrària

Alt valor agrari

ESTRATÈGIES D'ACTUACIÓ

Àmbits de regeneració

Espais de vora a replantejar

Nota: Pel que fa a l'àmbit del Parc Natural de Collserola se recullen les fites de transport establertes per la proposta d'ordenació del Pla Especial de protecció del medi natural i del paisatge del Parc Natural de la Serra de Collserola en la seva Aprovació Inicial (2014)

Avanç PDU

PLA DIRECTOR URBANÍSTIC METROPOLITÀ

Servei de redacció del Pla Director. Direcció de Serveis d'Urbanisme

PROPOSTA indicativa

Mosaic agroforestal P.02

Escala A1 1/60.000 A3 1/120.000

0 1.00 1.500 2.000 3.000

AMB PDU Març 2019

Agroforestry mosaic

Biodiversity

— Identify species with significant natural value

Biodiversity

— Identify species with significant natural value

— Increase biodiversity in the project environment

Minimum number of actions

Reference data

14.1 Table of values for the 2020 horizon.

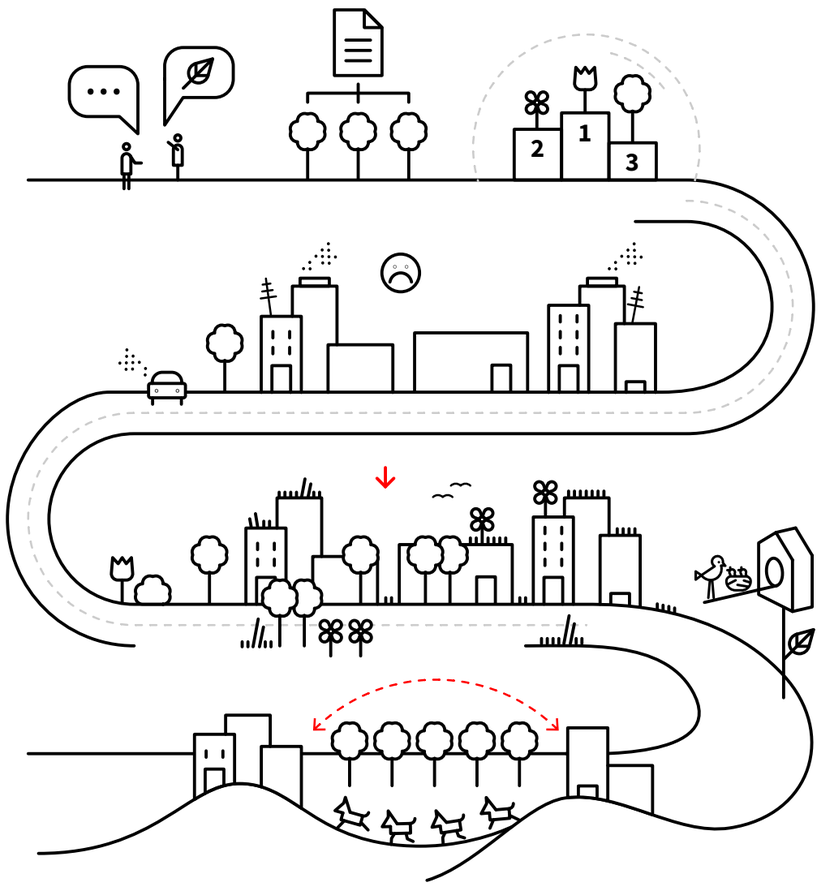
Project type	Number of measures to be completed
Buildings*	3
Streets	3
Squares	5
Parks	7

(*) See conditions in the Sustainability Protocol.

Increase in biodiversity:

— Vegetation
— Fauna
— Soil
— Habitat connectivity

Source: AMB sustainability protocol



Biodiversity

— Identify species with significant natural value

— Increase biodiversity in the project environment

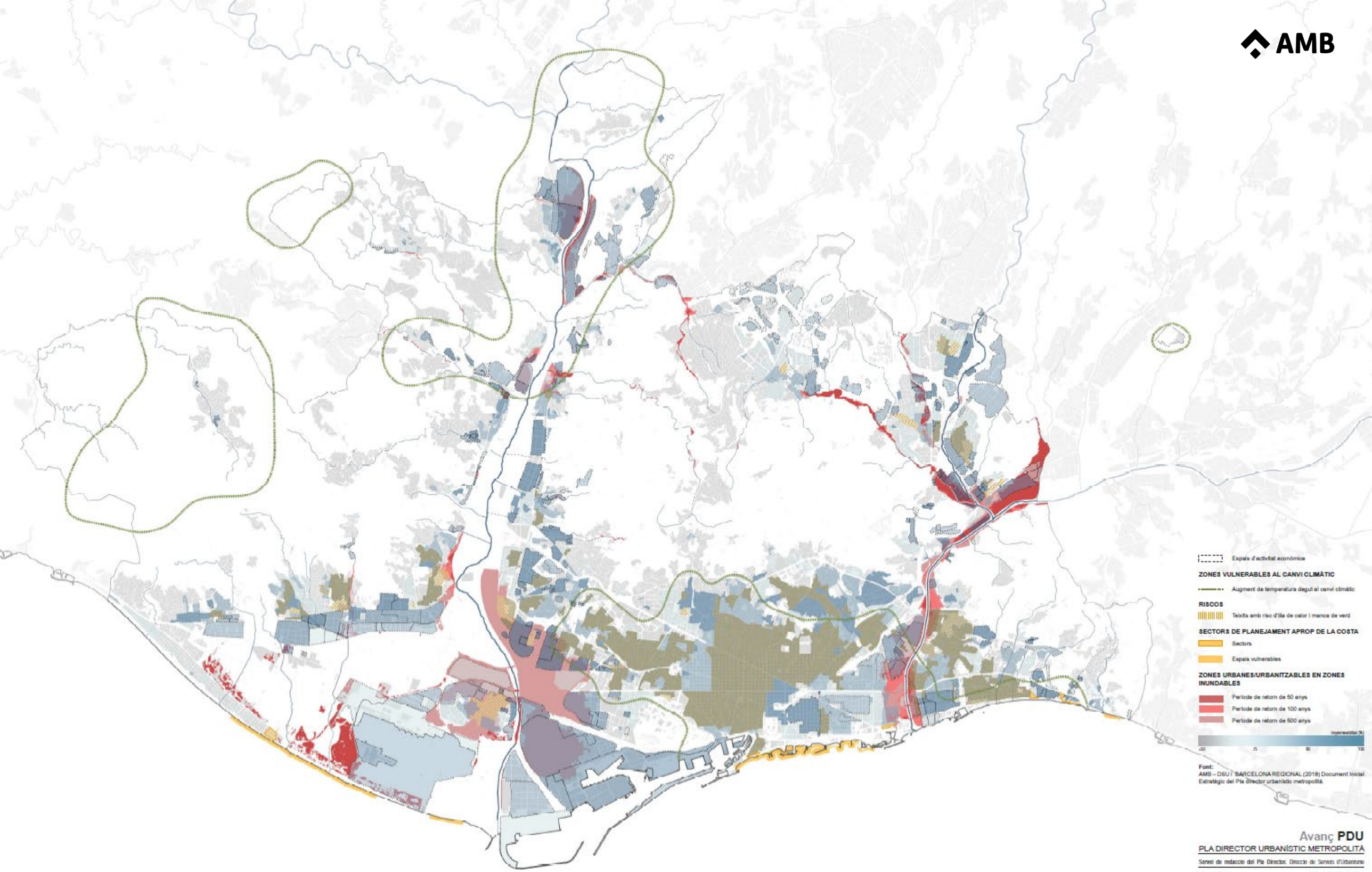
—Promote ecological corridors

AMB

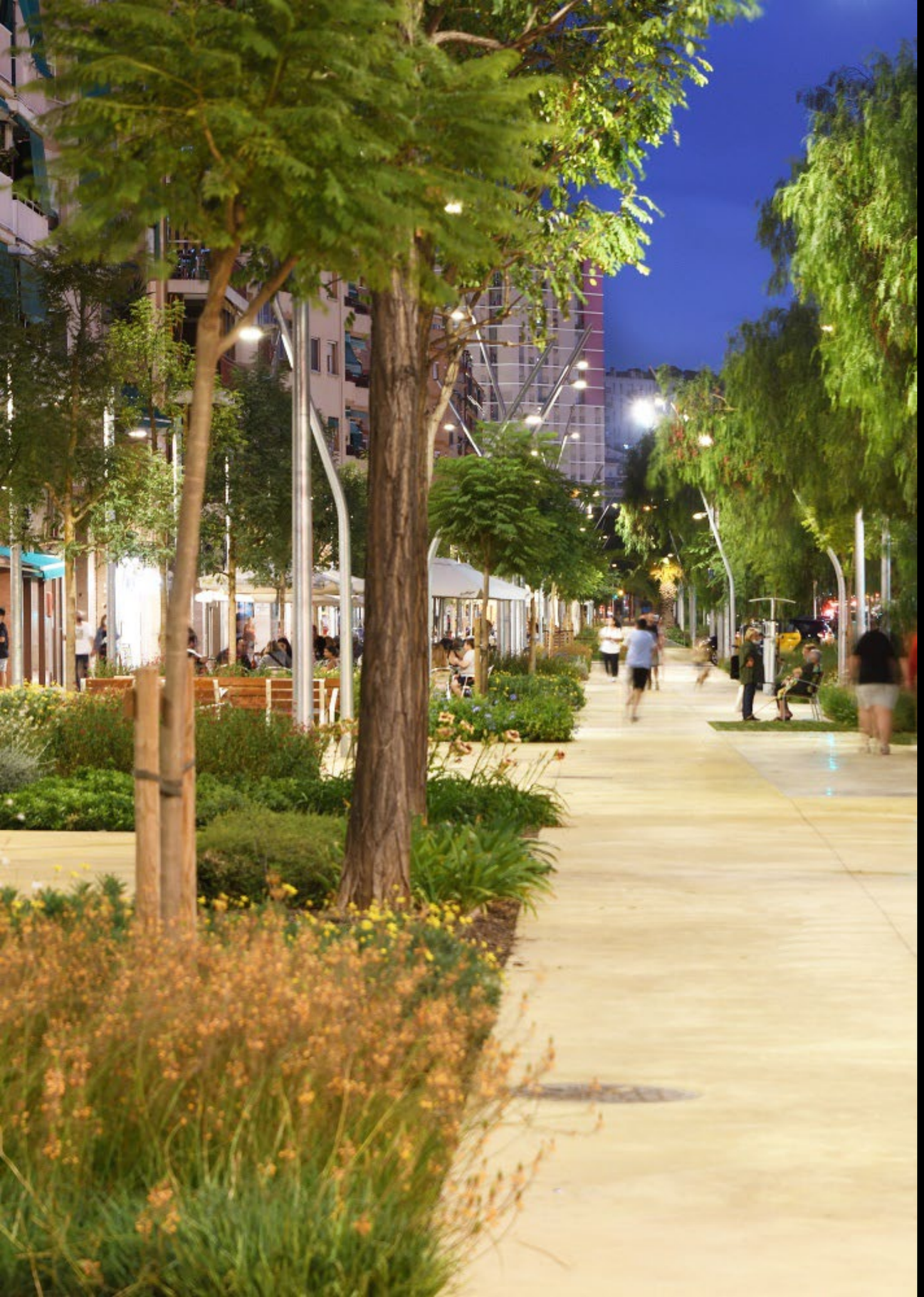
Health

- 157.000

Reduce urban mortality



Resilience and vulnerability to climate change



Health

— Increase green spaces

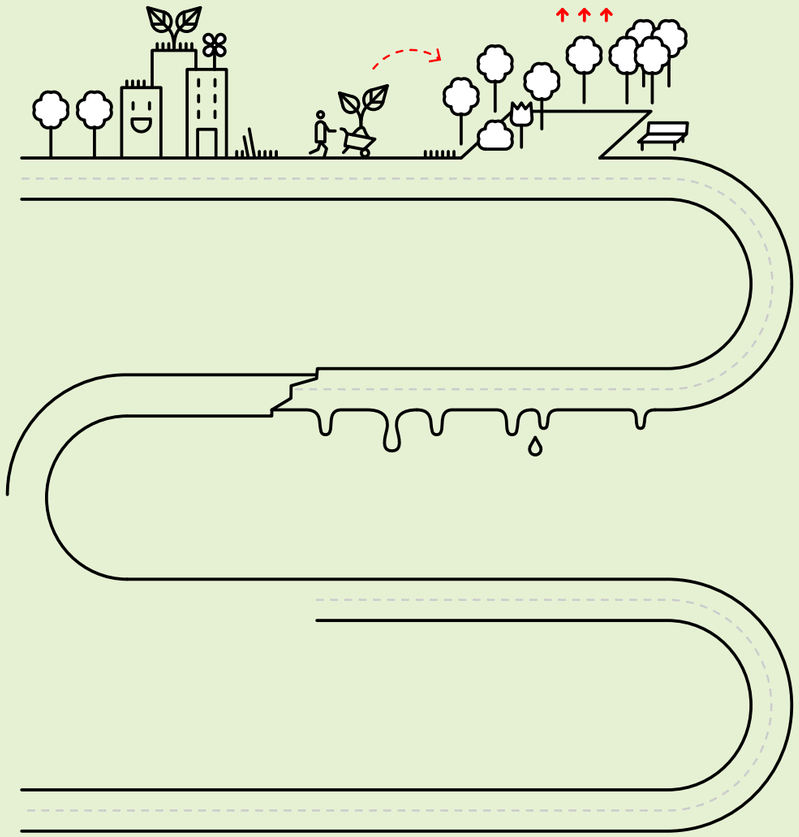
% surface

Minimum green surface

Reference data

13.1 Table of values for the 2020 horizon.

Project type	Total sum of vegetation layers	Green coverage
Buildings	20%	-
Streets	25%	25%
Squares	65%	50%
Parks	100%	70%



Source: AMB sustainability protocol

Joan de Batlle

Source: AMB

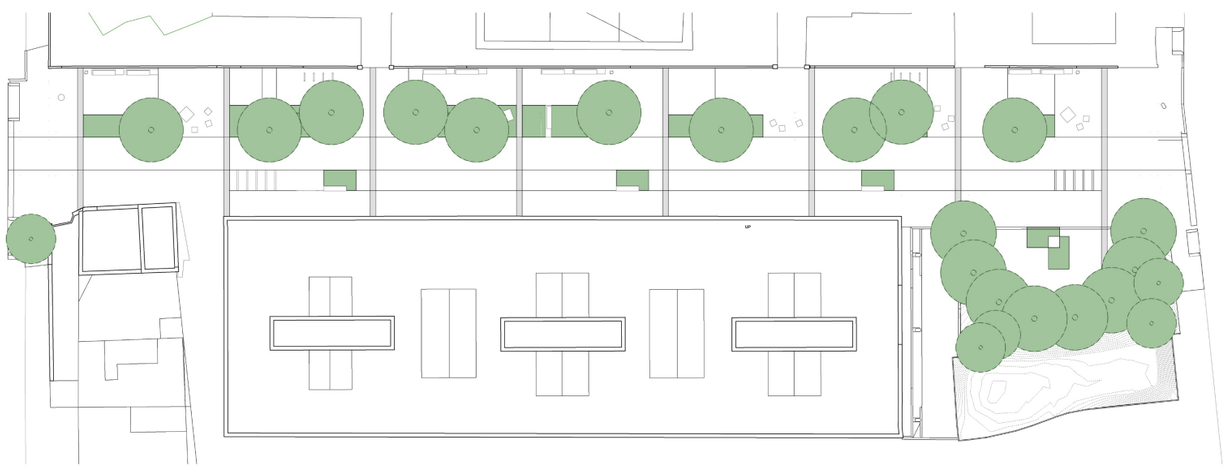
Case study

Joan de Batlle street in Sant Feliu de Llobregat (2021)

Green coverage

25%

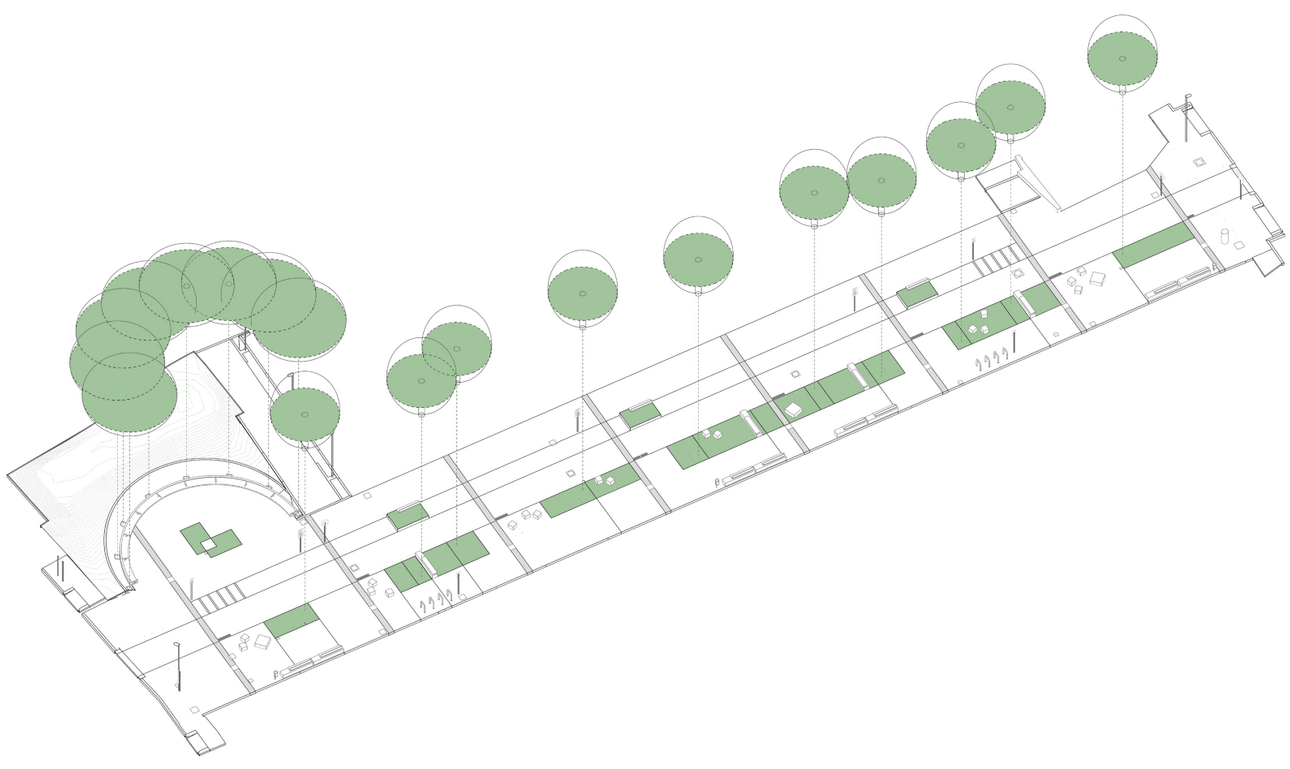
(requirement for streets: minimum 25%)



Sum of vegetation layers

29%

(requirement for streets: minimum 25%)



Source: AMB

Health

— Increase green spaces

— Reduce the heat island effect

% surface

Surface avoiding heat retention

Reference data

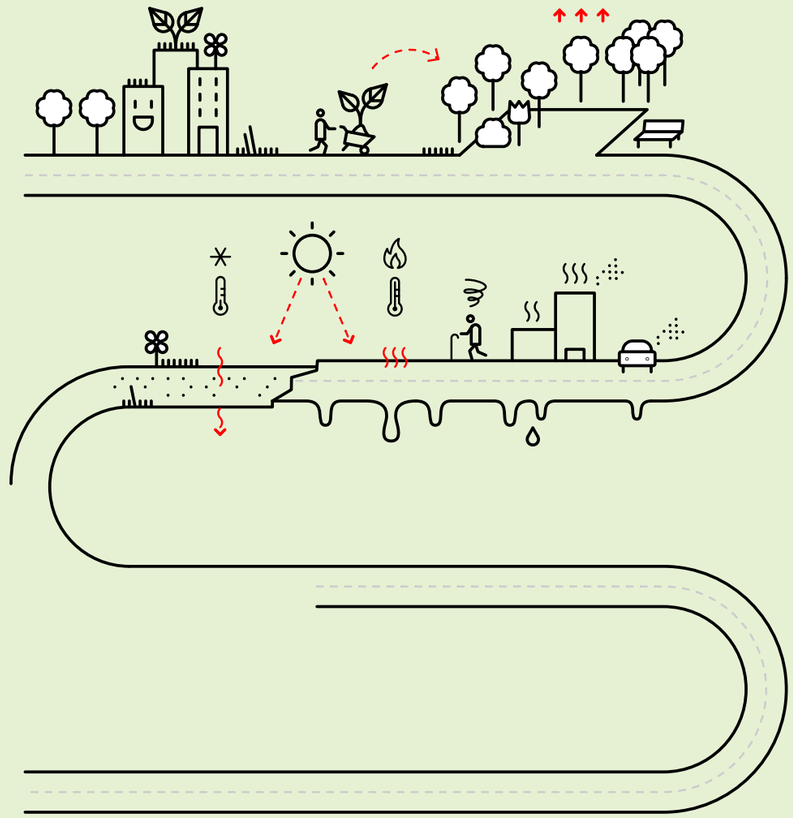
16.1 Table of values for the 2020 horizon.

Project type	Impermeable pavement surface exposed to sun
Streets	70%
Squares	45%
Parks	25%

Reference data

17.1 Table of values for the 2020 horizon.

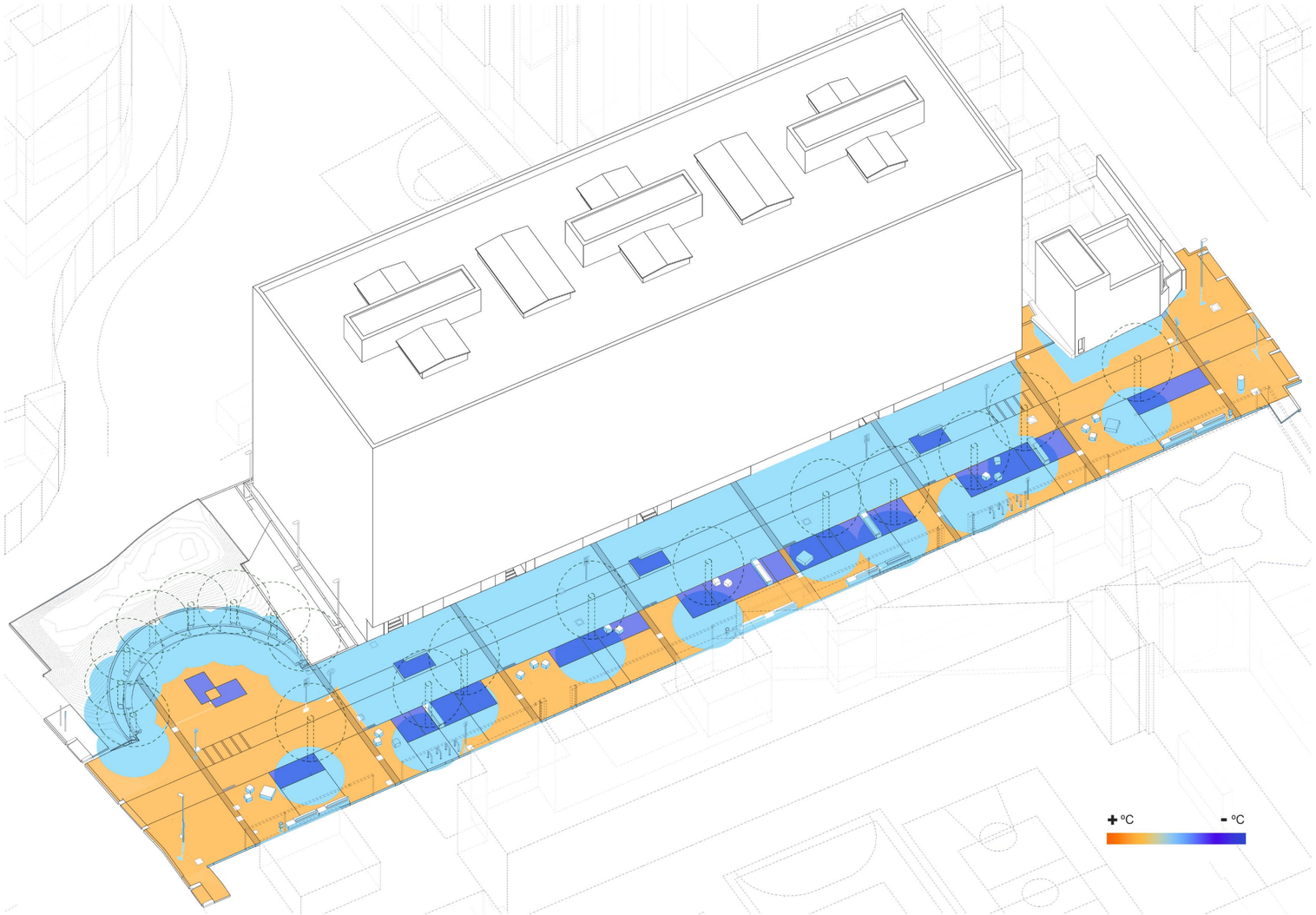
Roof surface	Surface of façades with greatest sun exposure
40%	40%



Source: AMB sustainability protocol

Case study

Joan de Batlle street in Sant Feliu de Llobregat (2021)



Impermeable surface exposed to sun
46%

(requirement for streets: maximum 70%)
Measured on june 21st, 13h

Strategies to reduce heat island effect in projects:

— Shadow
— Permeable pavements
— Green
— (Water)
— (Light colored materials)

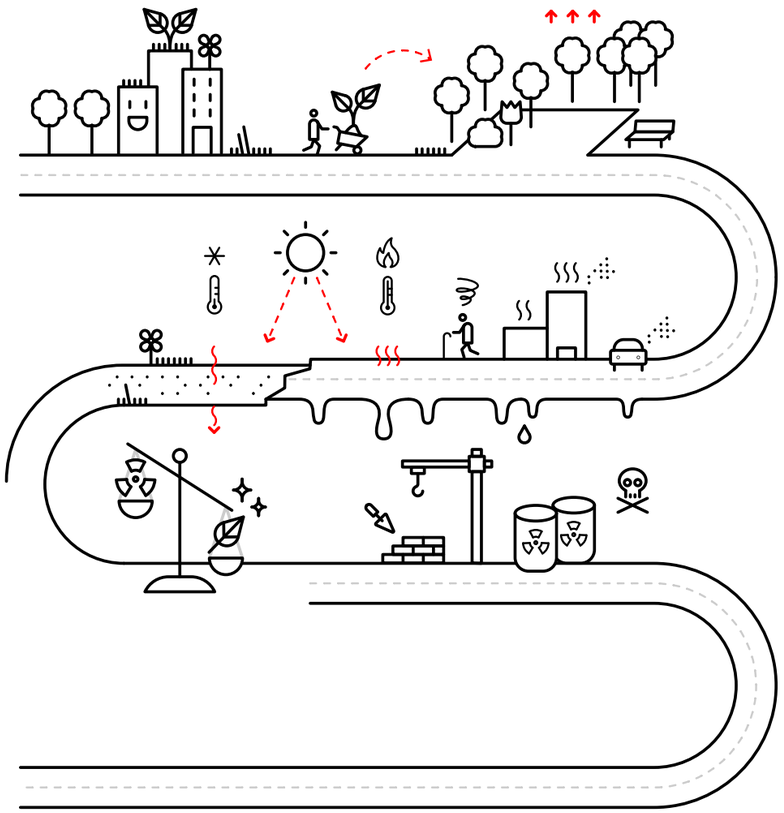
Source: AMB

Health

— Increase green spaces

— Reduce the heat island effect

— Avoid the use of harmful materials



Health

— Increase green spaces

— Reduce the heat island effect

— Avoid the use of harmful materials

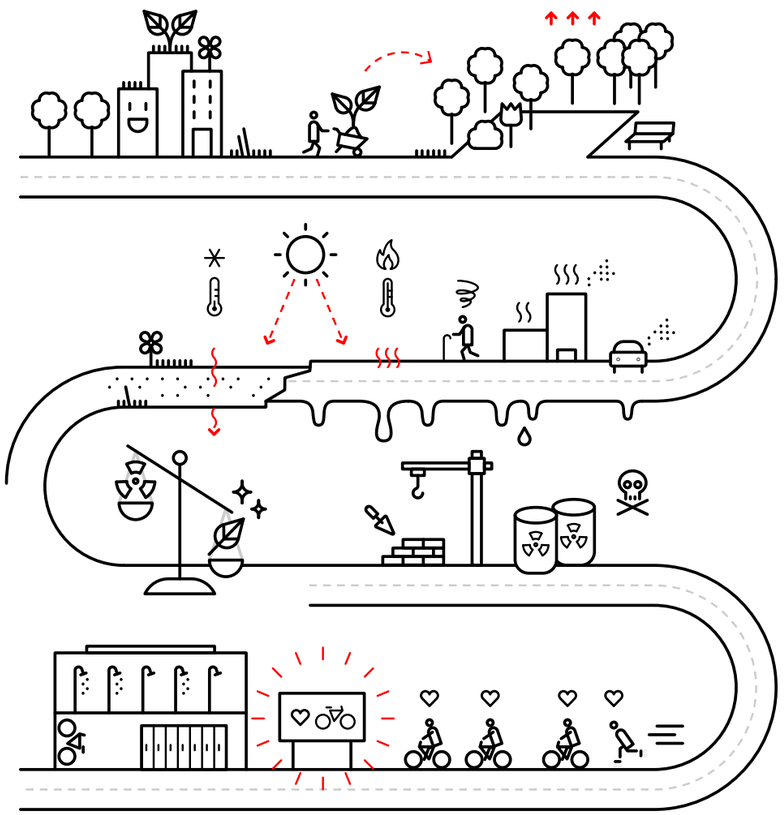
Health

— Increase green spaces

— Reduce the heat island effect

— Avoid the use of harmful materials

— Promote sustainable mobility



Health

— Increase green spaces

— Reduce the heat island effect

— Avoid the use of harmful materials

— Promote sustainable mobility

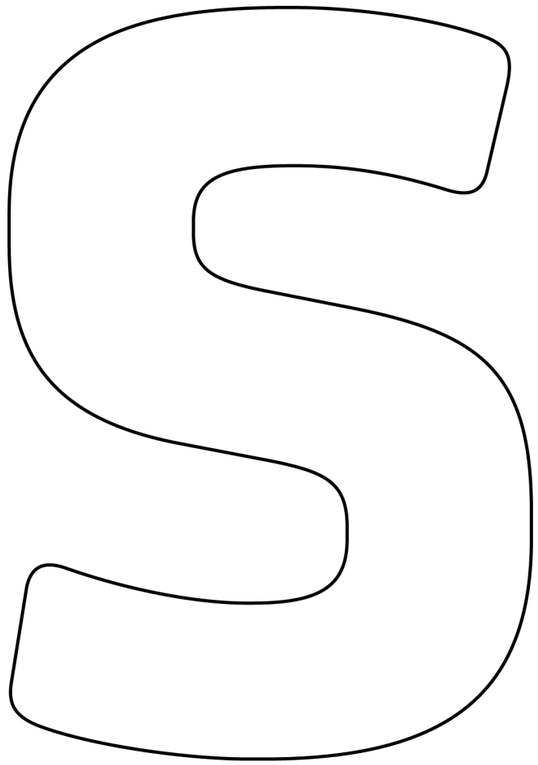
Sustainability protocol

Quick guide

Environmental criteria

for AMB and IMPSOL

projects and works



v. 1.2 / 2021

AMB

AMB

6

areas

19

criteria

- **Transversal analysis and follow-up**
- **Water**
- **Energy**
- **Comfort and health**
- **Materials**
- **Site sustainability**

AMB

SUSTAINABLE DEVELOPMENT GOALS

Source: https://sdgs.un.org/goals

Catalan/ Spanish

1 Anàlisi d'alternatives i optimització del programa

Objectiu

Valorar la idoneïtat de la proposta de programa inicial i analitzar possibles alternatives, amb la finalitat de reduir al màxim la petjada ecològica.

Tipus de projecte

- Parcs
- Carrers i places
- Edificis d'equipaments
- Edificis d'habitatges

Criteris relacionats que cal tenir en compte

— **3** Manteniment i explotació eficients
— **4** Minimització de la demanda i del consum energètics
— **5** Generació d'energia renovable per a autoconsum
— **7** Minimització de la petjada de CO_2
— **18** Facilitats per als vehicles unipersonals sostenibles

Requisits

1.1 Anàlisi d'alternatives d'emplaçament

Anàlisi comparativa d'emplaçaments alternatius que justifiqui la selecció de la millor opció en relació amb els aspectes següents:

a. Existència d'edificacions o espais per rehabilitar alternatius a la nova construcció, on es pugui implantar el projecte.

   Per a la rehabilitació d'edificis, s'ha de fer una auditoria energètica.

b. Mobilitat generada: accés amb sistemes de mobilitat més sostenible com el transport públic o els vehicles de mobilitat personal (VMP), i accés per a vianants.

c. Preexistències rellevants.

1.2 Optimització del programa funcional

Anàlisi del programa funcional i optimització del projecte valorant els aspectes següents:

a. Identificació de sinergies amb altres edificis o instal·lacions municipals existents.

b. En edificis: anàlisi dels usos interiors i optimització de la seva distribució.

Implantació

Cal completar la pestanya "criteri 1" de l'eina *AMB Sostenibilitat* per justificar el requisit.

1.1 Anàlisi d'alternatives d'emplaçament

En la selecció de la parcel·la, l'ajuntament ha de tenir en compte els aspectes següents:

a. S'ha d'intentar reduir la superfície d'obra nova per construir, aprofitant espais ja existents que puguin acollir la totalitat o part del programa que s'ha d'implantar.

- Simplicitat de les comunicacions.
- Sinergies entre les instal·lacions.

– Conclusions: programa funcional optimitzat (justificació en cas que no es pugui reduir).

Documents per lliurar

Eines complementàries

– Fitxa resultat de l'eina *AMB Sostenibilitat* (criteri 1).
AN9 Aspectes ambientals
AN22 Aspectes ambientals

Documentació (tècnica) justificativa

– Estudi d'optimització del programa funcional del projecte, incloent-hi un informe justificatiu i plànols comparatius entre els dos programes on s'indiquin les millores d'un respecte a l'altre.
MD 4.1 Descripció general
MD 1.1.2 Antecedents, àmbit d'actuació i situació prèvia

– Anàlisi d'alternatives d'emplaçament, incloent-hi un informe justificatiu i plànols de situació que justifiquin la decisió.
MD 4.1 Descripció general
MD 1.1.2 Antecedents, àmbit d'actuació i situació prèvia

Documentació de referència

– SITES, Section 2: Pre-design assessment + Planning.
– Direcció de Serveis de l'Espai Públic (2018). *Metodologia. Treball en equip en la redacció de projectes.*
– LEED BD+NC V.4, Credit Integrative Process & Credit Site Assessment.
– Climate Consultant i tutorials: http://www.energy-design-tools.aud.ucla.edu/.

English

This **Quick Guide** sets out the main points of the **Sustainability Protocol**, although to apply the criteria and requirements, the full version of the Protocol should be consulted, which contains the **associated tables**, the **implementation procedure** and **references** to standards, tools and technical guidelines.

Cross-cutting follow-up and analysis

1 Analysis of alternatives and programme optimisation

Objective
Assess the suitability of the initial programme proposal and analyse possible alternatives in order to minimise the ecological footprint.

Project type	Requirements
	1.1 Analysis of alternative sites. 1.2 Optimisation of the functional programme.

2 Integrated environmental follow-up

Objective
Help to ensure that decisions affecting the project's environmental sustainability are taken into account from the outset and throughout the drafting and construction process, in all areas and in coordination with the city council.

Project type	Requirements
	2.1 Integrated environmental follow-up of the project with the council.

3 Efficient maintenance and operation

Objective
Ensure the durability and proper maintenance of the project and its installations during its service life, starting from the drafting of the project and taking into account the end user.

Project type	Requirements
	3.1 Verification of spaces, auxiliary equipment and accessibility for maintenance. 3.2 Completion of a maintenance analysis. 3.3 Definition of a waste management strategy during the use phase. 3.4 Incorporation of energy and water consumption monitoring systems. 3.5 Facilities buildings: building energy management systems (BMS).
	3.6 Verification of spaces, auxiliary equipment and accessibility for maintenance. 3.7 Completion of a maintenance analysis. 3.8 Incorporation of energy and water consumption monitoring systems. 3.9 Publication and submission of the user's handbook.

Energy

4 Energy demand and consumption minimisation

Objective
Optimise energy demand through passive design strategies, while also reducing primary energy consumption through good installations design and the use of high-efficiency systems.

Project type	Requirements
	4.1 Optimisation of passive design. 4.2 Maximum values of overall energy demand and total primary energy consumption (PEC). 4.3 Energy rating A.

Reference data

4.2 Table of values for the 2020 horizon.

Building's energy load according to its main use	Global demand (kWh/m²year)	Zone C2 Total PEC (kWh/m²year)	Zone D2 Total PEC (kWh/m²year)
High/ very high*	20	110	90
Average*		95	85
Low*	15	35	40

Project type	Requirements	Reference data
	4.4 Outdoor lighting energy consumption estimate. 4.5 Minimum energy efficiency values for outdoor lighting installations.	4.5 Table of values for the 2020 horizon. Energy Efficiency Index (EEI): > 2.0*

(*) See conditions in the Sustainability Protocol.

5 Renewable energy generation for self-consumption

Objective
Promote the installation of on-site energy generation systems that use renewable sources.

Project type	Requirements	Reference data
	5.1 Minimum renewable electric power capacity to be installed. 5.2 Calculation of total coverage from renewables.	5.1 Table of values for the 2020 horizon.

Project type	Minimum generation	Additional percentage required by the CTE
Streets (1)	15 kWp | 2 kWp	
Parks and squares (1)	15 kWp | 2 kWp	
Facilities buildings (2)		5% - 20%
Housing units (2)		5% - 20%

(1) (2) See conditions in the Sustainability Protocol.

Water

6 Minimisation of potable water consumption

Objective
Limit consumption of mains drinking water through highly efficient installations, while prioritising the use of alternative water resources (when available) where this is possible.

Project type	Requirements	Reference data
	6.1 In buildings: maximum water flow rates for sanitary fixtures. 6.2 In buildings: grey water recovery systems. 6.3 In buildings with gardens: rainwater harvesting systems. 6.4 Limitation of water consumption in green spaces: irrigation installations. 6.5 Control of water consumed for water games.	6.1 Table of values for the 2020 horizon.

Project type	Bathroom* (l/min)	Kitchen (l/min)	Shower (l/min)	Toilet (l)	Urinal ** (l)
Facilities buildings	1.5	5	5	3/4.5	1.2
Housing units	3	6	5	3/4.5	-

(*) See conditions in the Sustainability Protocol.

6.2 In facilities buildings: 400 m³ or more of grey water. In housing: 40 housing units upwards.
6.3 Mandatory if there is 500 m² or more of catchment area and 200 m² or more of watered garden.
6.4 Table of values for the 2020 horizon.

Drinking water consumption (l/m²year)	Total consumption (l/m²year)
450	700

Materials

7 Minimisation of carbon footprint

Objective
Implement strategies to limit CO_2 emissions from buildings and public spaces throughout their life cycle. Measure and assess the embodied carbon footprint of materials in their manufacturing and construction phases.

Project type	Requirements	Reference data
	7.1 Preliminary definition of materials and construction systems. 7.2 Maximum values for embodied carbon footprint of materials.	7.1 Table of values for the 2020 horizon.

Project type	Carbon footprint (kgCO₂/m²) depending on type of intervention: New building/ Redevelopment*	Renovation*
Housing units*	611	324
Administrative facilities	640	339
Sports facilities	701	372
Other facilities*	681	361
Streets**	163	33
Squares**	209	42
Parks**	67	13

(*)(**) See conditions in the Sustainability Protocol.

8 Use of materials with ecolabels I and III

Objective
Ensure that a significant proportion of the materials used in the construction process meet the highest sustainability standards.

Project type	Requirements	Reference data
	8.1 Minimum percentage of materials with ecolabels type I and III.	8.1 Table of values for the 2020 horizon.

Facilities buildings and housing	Streets, squares and parks
20%	10%

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Achieve a balance of zero emissions in 2050

Close the water cycle

Enhance and preserve the biodiversity

Decrease the mortality and disease rate attributed to urban areas

Thank you!

Download the protocol

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